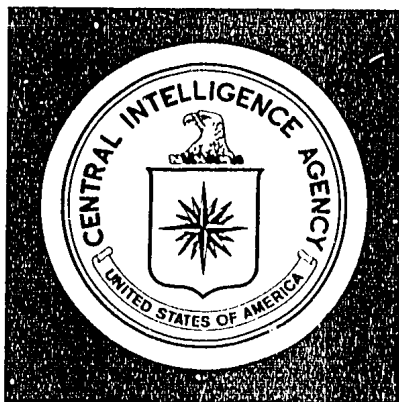


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# Intelligence Report

## *China Builds Pipelines to Boost Petroleum Exports*

NGA Review Completed.

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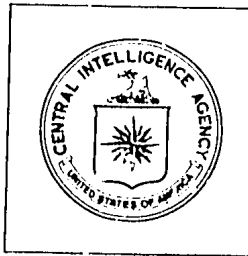
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**China Builds Pipelines  
To Boost Petroleum Exports**

**SUMMARY**

China has undertaken a multi-million dollar program since 1970 to build pipelines as part of a major effort to exploit its extensive petroleum resources. At the outset the program was aimed mainly at meeting domestic requirements for transporting petroleum. The need to pay for soaring imports and the sudden increase in world prices in 1973 led the Chinese to accelerate construction of pipelines to take advantage of new export opportunities.

The sudden push in construction has increased the national pipeline network to more than 3,600 miles, five times the 700 miles that existed in 1970. Approximately 1,600 miles of pipeline were laid in 1974 alone. Additional projects under construction or planned will raise the national network to about 5,000 miles within the next two or three years.

The new pipelines and associated port improvements will enable China to handle crude oil exports of 10 to 12 million tons this year and perhaps 20 million tons in 1977. If planned pipelines and port facilities are completed as expected, China will have the capability to meet the projected export goal of 50 million tons of crude to Japan by 1980. This level of exports would place China among the top 10 nations as an exporter of petroleum.

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Note: Comments and queries regarding this report are welcome. They may be directed to [redacted] of the Office of Economic Research, [redacted]

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## DISCUSSION

## Background

1. A shortage of rail capacity and petroleum handling facilities has been a chronic problem in transporting China's growing output of crude oil. China became essentially self-sufficient in crude oil in 1965, and output has since grown more than 500%, to 65 million metric tons in 1974.<sup>1</sup> Pipelines are the most efficient means of transporting such large amounts of crude oil, but before 1970 the Chinese had only about 700 miles of pipelines, almost all located in the Karamai and Yu-men oilfields in the remote western part of the country. Only a relatively short pipeline from Ta-kang oilfield to Tientsin served the eastern seaboard (see Figure 1). In 1971 the Chinese launched a pipeline construction program that was aimed at moving crude oil from the large new oilfields in Manchuria and Shantung Province to refining centers and ports.

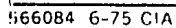
	Million Tons	
	Production	Exports to Non-Communist Countries
1950	0.2	
1960	5.5	
1965	10.8	
1970	28.5	
1971	36.7	
1972	43.0	Negl.
1973	54.5	1.0
1974	65.3	4.5
1975 <sup>1</sup>	78.0	10.0
1980 <sup>1</sup>	195.0	50.0

1. Projected.

1. For consistency, metric tons are used throughout this report. In conventional usage, a metric ton contains 7.3 barrels. To convert metric tons per year to barrels per day divide by 50.

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**Figure 1**



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## The Construction Program

4. Although China's rail tank car inventory grew from only 9,600 in 1960 to more than 30,000 in 1969, the railroads were unable to handle the 22% average annual increase in crude oil production. Some new wells drilled in 1969-70 at the Ta-ch'ing oilfield in Manchuria reportedly were capped because transportation was not available. The pipeline construction program, therefore, was originally planned to relieve the overburdened railroad system in the northeast.

### *Between 1970 and 1973*

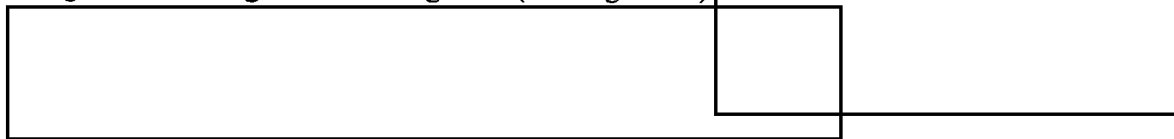
5. Pipeline construction began in the northeast late in 1970 with the start of a line from the Ta-ch'ing oilfield to the Fu-shun refinery (see Figure 2). The Ta-ch'ing to Fu-shun pipeline was completed in early 1972. The second major pipeline in the northeast was begun in August 1972 and was laid from T'ieh-ling, a large pumping station on the Ta-ch'ing to Fu-shun line, to new port facilities at Ch'in-huang-tao. This line was apparently developed to relieve the severe port congestion at Dairen. The line handles a large part of the oil shipments destined for refineries at Shanghai and Nan-ching. A third line in the northeast, built in 1972, was an extension of the Ta-ch'ing - Fu-shun line to the refinery at An-shan.

6. The only pipeline construction outside the northeast in this period was a line built in 1972 in Hupeh Province to connect Chien-chiang oilfield to the Ching-men refinery. Chien-chiang is the only producing oilfield in southeast China. The pipeline also connects Chien-chiang oilfield to a river-to-barge transshipment point on the Yangtse River, allowing crude to be shipped downstream to refineries at Wu-han, Nan-ching, and Shanghai.

### *Since 1973*

7. The world oil crisis in the fall of 1973 was a turning point for China's petroleum industry. A threefold increase in the world price of oil provided the incentive to market crude on a large scale. Pipeline construction accelerated sharply after September 1973 in order to take advantage of expanded export opportunities. The pace of construction in recent years is shown in the tabulation.

8. In September 1973 the Chinese began a pipeline running parallel to the original Ta-ch'ing to T'ieh-ling line (see Figure 3).

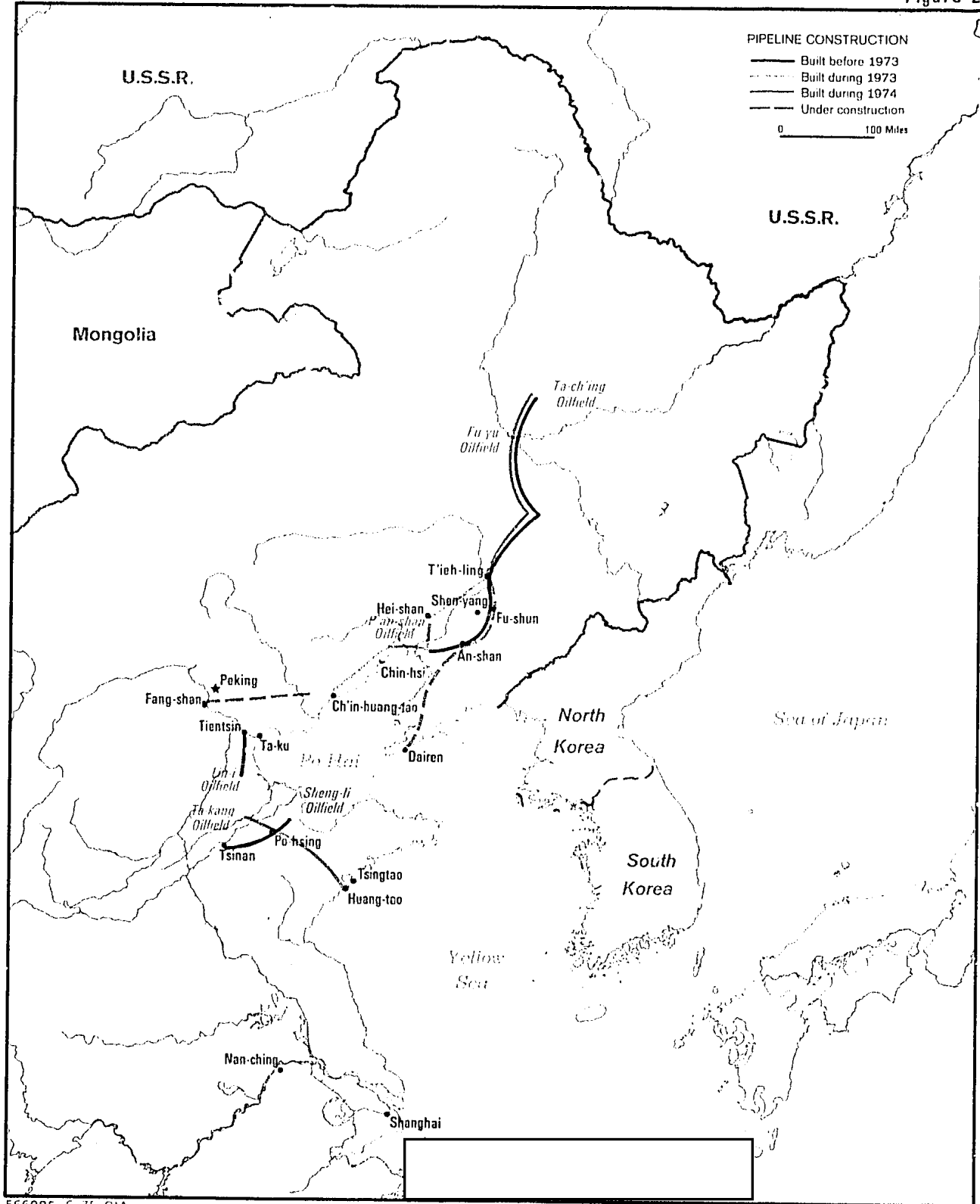


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# Growth of the Pipeline Network in Northeast China

Figure 2



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[redacted] A second project was started in late 1973 to connect the Sheng-li oilfield in Shantung to a deep water oil port under construction at Huang-tao Island near the port of Tsingtao.

	Miles Installed <sup>1</sup>
<b>Total</b>	<b>3,620</b>
Prior to	
1966	660
1966	0
1967	0
1968	0
1969	45
1970	0
1971	40
1972	500
1973	580
1974 <sup>2</sup>	1,570
1975 <sup>3</sup>	225

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9. The construction program peaked in 1974. The northern part of the Ta-ch'ing - T'ieh-ling - Ch'in-huang-tao system was finished by August, and a pipeline linking Sheng-li oilfield to Huang-tao port was completed in December. A pipeline designed primarily to support crude exports - T'ieh-ling to a new port near Dairen - was begun in mid-year. During 1974, other pipelines totaling between 100 and 150 miles were completed as the Chinese fleshed out the northeast network.

#### *Tibet: A Special Case*

10. While the Chinese have emphasized pipeline construction in the northeast, they also have started a major new line in the far west. In mid-1974 the Chinese began the 630-mile Tibet to Tsinghai system running from Lhasa to Ko-erh-mu, the northern terminus of the Tibetan logistical system. Completion of the pipeline will greatly ease Tibet's extremely difficult transportation problem by assuring a reliable, all-weather supply of fuel and petroleum products to this isolated region. Moreover, it will save a considerable part of the fuel presently consumed by cargo trucks that are used to transport petroleum products over the high Tibetan plateau and free additional truck space for general cargo.

#### **Sources of Pipe**

11. The Chinese claim that much of the pipe for the northeast system came from domestic pipe and tube mills. New pipe mills were built in six northeastern cities expressly to supply pipe for the pipelines (see Figure 4). These mills reportedly made 200,000 tons of pipe from 1970 to 1973, enough for about 700 miles of pipeline.

12. Substantial imports of pipe from Japan have been required to supplement domestic sources. Japanese pipe manufacturers supplied a large share of the pipe

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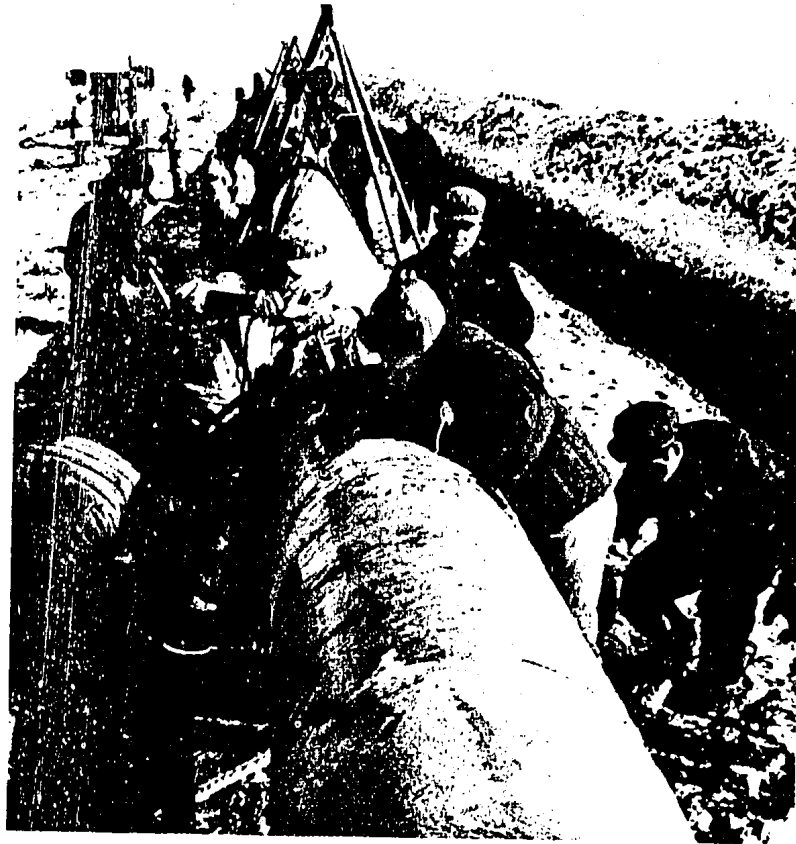


Figure 3. Pipe laying in Manchuria.

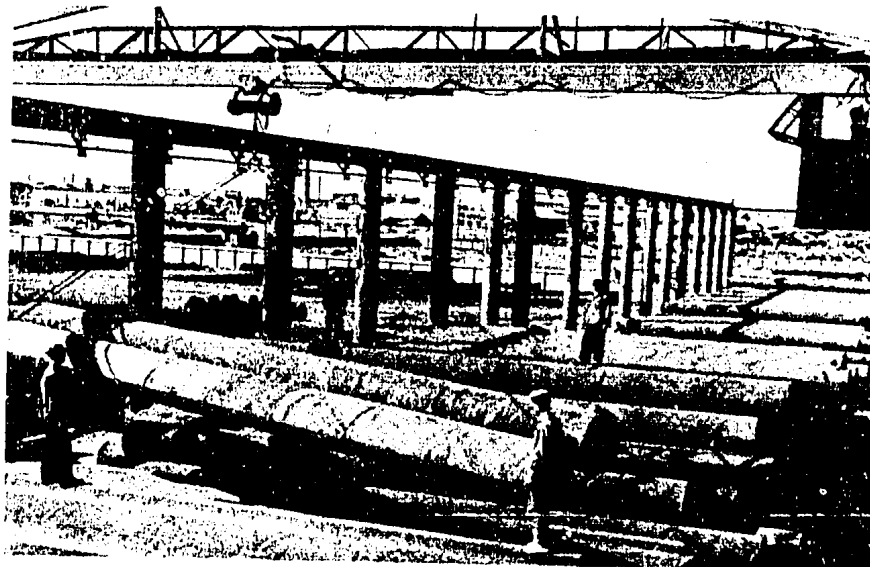


Figure 4. Steel pipe made by the Kirin Tubing Mill.

used in the big construction push of 1973 and 1974. Between 1968 and 1974, Japan supplied nearly 270,000 tons of pipe, enough to construct more than 1,000 miles of pipeline. About 60,000 tons of Japanese pipe have been ordered for delivery during 1975. The tabulation shows Chinese imports of pipe from Japan since 1968.

	Tons
<b>Total</b>	<b>328,000</b>
1968	40,000
1969	53,000
1970	59,000
1971	20,000
1972	8,000
1973	46,000
1974	42,000
1975 <sup>1</sup>	60,000

#### Supporting Construction

13. Construction of ports and storage facilities is an integral part of China's pipeline development program. In January 1973, Premier Chou En-lai issued a specific order to expand nine existing major ports. Four of these ports that handle petroleum shipments received special emphasis after the 1973 world oil crisis, and work began on two others, namely Huang Tao and a new port near Dairen. Five of the six oil ports are located in the northeast and one, Chan-chiang, is in southern China. Chan-chiang handles most of China's petroleum imports for the Canton area (see Figure 2 and Figure 5). Port improvement involves constructing new oil wharves and storage tanks and dredging channels to increase the size of ships able to use the port.<sup>2</sup>

14. The largest port construction project is the preparation of a new port near Dairen. This installation is located on the peninsula at the entrance to Dairen Bay and when completed will have a storage capacity of more than 300,000 tons. The Chinese are negotiating for a specially designed offshore mooring buoy with underwater pipeline attachments for use in loading very large tankers (over 100,000 DWT). The port may eventually be able to handle tankers up to 200,000 DWT. Chinese ports presently can handle tankers no larger than 70,000 DWT. The tabulation below shows the additions in storage capacity since 1973 at China's six major oil ports.

Port	Estimated Storage Capacity Added Since 1973 (Tons)	Estimated Total Storage Capacity (Tons)
Dairen (new port)	300,000	300,000
Ch'in-huang-tao	280,000	280,000
Huang-tao	210,000	210,000
Chan-chiang	9,000	90,000
Dairen	18,000	65,000
Ta-ku	50,000	50,000

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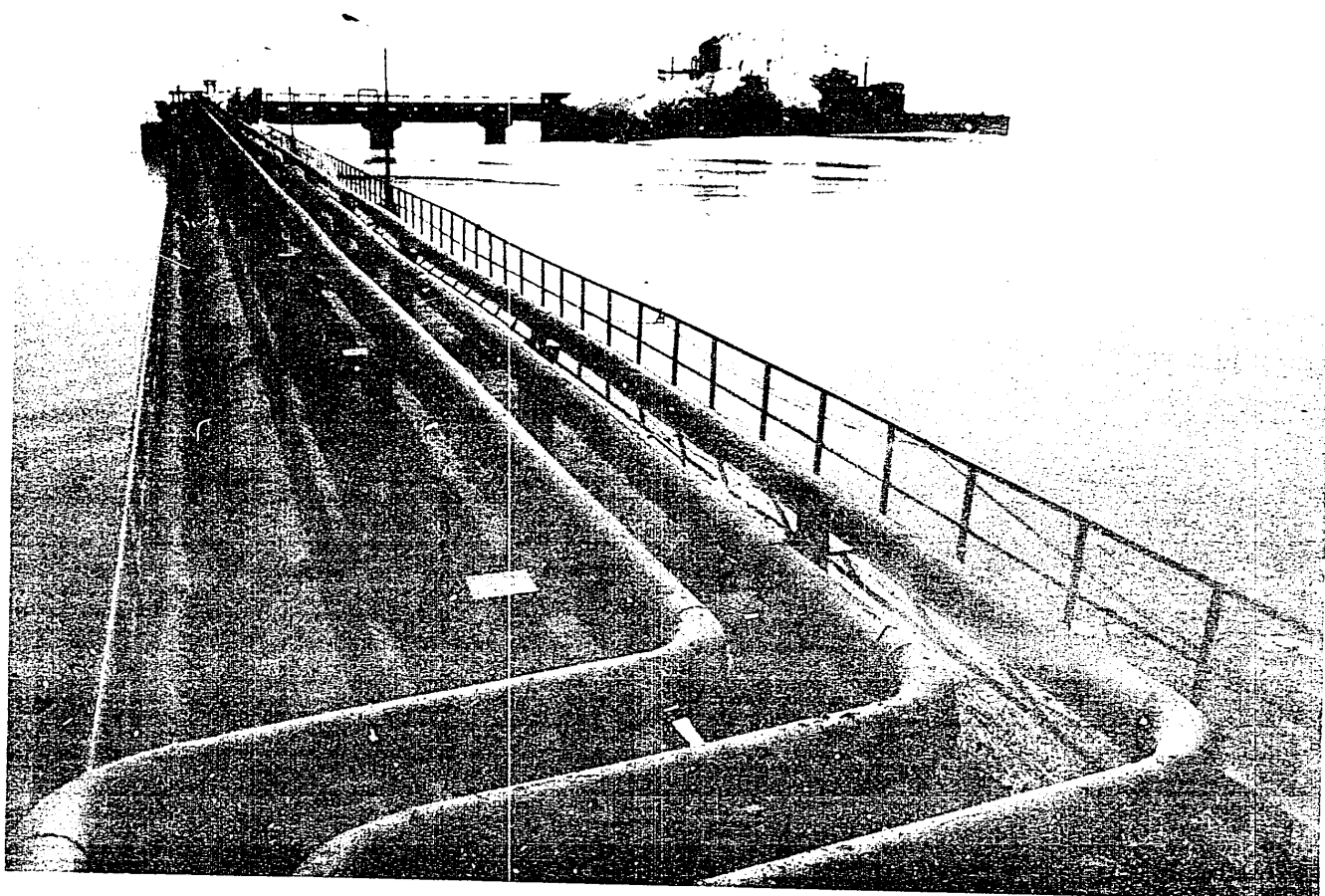


Figure 5. The oil terminal at Ch'in-huang-tao.

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### A Note on the Cost of the Program

15. On the basis of an analogy with US and Soviet pipeline costs, China's program to expand its pipeline network since 1970 could run as high as \$200 million by 1975. This figure excludes the costs involved in expanding ports and major storage facilities. The foreign exchange cost of developing the pipeline network and associated installations has been about \$100 million. This figure is about evenly divided between the costs of imported pipe and expenditures for pipelayers, bulldozers, and other construction equipment used in the program.

### Capacity to Meet Future Exports

17. Observers of China's oil scene generally agree that the Chinese will have the capacity to produce enough crude oil to meet future export goals of up to 20 million tons in 1977 and 50 million tons by 1980. During the past two years, however, inadequate transportation facilities have hampered China's efforts to raise exports. The recent program to build new pipelines and expand port facilities should eliminate these limitations and place the export targets within reach. Two pipelines in the northeast – Ta-ch'ing to Ch'in-huang-tao and Sheng-li to Huang-tao – with a total transport capacity of about 22 million tons are already in place. The important Ta-ch'ing to Dairen pipeline is in a mid-stage of construction, and, when completed later this year, will add 10 million tons of new capacity. Another line apparently is planned to run parallel to the one currently under construction between Ta-ch'ing and Dairen. This line will increase the total pipeline capacity in the northeast to almost 50 million tons and, together with ongoing port improvements, should give the Chinese the capacity to move into the front rank by 1980 as a world exporter of petroleum.

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